UNIVERSITY OF NORTH BENGAL

B.Sc. Programme 1st Semester Examination, 2024

DSC1/2/3-P1-COMPUTER SCIENCE

COMPUTER SYSTEM ARCHITECTURE

Time Allotted: 2 Hours   Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

Answer any *four* questions from the following $3 \times 4 = 12$

1. State the need for indirect addressing mode. Give suitable example.
2. Subtract $(11010)_2 - (10000)_2$ using 1's complement and 2's complement method.
3. What are the differences between PROM and EPROM?
4. Explain the working of a JK flip-flop with a neat diagram.
5. Differentiate between ASCII and EBCDIC.
6. Convert $(27.35)_8$ to base of 10.

GROUP-B

Answer any *four* questions from the following $6 \times 4 = 24$

7. Explain the following:
   (i) Cache Memory
   (ii) Associative Memory.
8. Simplify the following Boolean function using four variable K-Map. Also draw logic diagrams of original and simplified circuits.
$$F(A, B, C, D) = \Sigma(0, 2, 4, 6, 7, 8, 10, 13, 15)$$
9. Discuss about the basic instruction types with suitable example.
10. An 8 bit register contains the binary value 10011100. What is the register value after arithmetic shift right? Starting from the initial number 10011100, determine the register value after an arithmetic shift left, and state whether there is an overflow.
11. What is the significance of addressing modes? Explain Direct, Immediate and Relative addressing modes with examples.
12. Explain how multiple interrupts are handled.

GROUP-C

Answer any *two* questions from the following $12 \times 2 = 24$

13. Draw and explain the data movement among registers using common bus.
14. Give the introduction of control units. Explain the micro programmed control unit.
15. Compare and contrast RISC and CISC architecture. Discuss DMA.
16. Draw and explain the flowchart of instruction cycle.

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